CSE111:ORIENTATION TO COMPUTING-I

L:2 T:0 P:0 Credits:2

Course Outcomes: Through this course students should be able to

CO1 :: understand the various functional components of a computer system and basics of computer language.

CO2 :: explain operating system components and functionalities, and manage various file systems and processes in Windows and Linux.

CO3 :: describe Linux OS features, installation, directory structure, disk partitions, shell commands, kernel types, and comparison with Windows OS.

CO4 :: predict cohorts based on their technical skillset, understand the relevance of various pathways, and obtain insights of MOOC 's platforms.

CO5 :: understand network components, configurations, and server types, and identify and mitigate security issues effectively.

CO6 :: practice technical concepts of version control using git and GitHub and create technical profiles on different computing platforms

Unit I

Computer Systems : Basic structure of computer and its working, Computer associated peripherals, Memories - RAM, ROM, Secondary storage devices, System Configuration – features and comparison (SSD vs hybrid, types of RAMs, Processors - cores/threads), BIOS Configuration, Compare and contrast PC connection interface (USB, SATA, HDMI, NFC, Bluetooth), RAID, GPU basics, Synchronization across CPU and GPU.

Computer Languages : Machine language, Assembly language, High level language, Steps in development of a program, Compilation and Execution, Compiler, Interpreter, Assembler.

Unit II

Operating System : Operating Systems and its components, Windows Operating System Versions and features, Installation Process, Directory Hierarchy of Windows Operating System (Single level and multiple level), Bootloader.

File system management : File system basics, Types of file systems (FAT, GFT, HFS, NDFS, UDF, Extended file systems), Pipes and redirection, Searching the file system using find and grep with simple regular expressions, Basic process control using signals, Pausing and Resuming process from a Linux terminal, terminating a process, Adding/removing from search path using PATH variable.

Unit III

Linux Operating System : Linux OS and its features, Distribution versions, installation process, Directory Hierarchy of Linux System (single level and multiple level)., Partitions: Understanding disk partitions and obtaining partition information using system tools, Comparison of windows and Linux OS, Virtual Machines.

Other Shell commands : ls, cat, man, cd, touch, cp, mv, rmdir, mkdir, rm, chmod, pwd, ps, kill, etc, Kernel and types of kernels.

Unit IV

Cohorts and Skill Sets : Introduction to Cohorts, Purpose of Cohorts, Companies, Skills required and skill sources for different Cohorts (Internal and External)

Types of Cohorts : Cloud Computing, Cyber Security, Data Science, Full Stack Development, Machine Learning, Software Methodologies and Testing, UI/UX, Metaverse and Internet of Things, Job Roles for Different Cohorts

Pathways : Introduction to Pathways, Purpose of Pathways, Job Roles for Different Pathways, Types of Pathways: Product Based, Service Based, Government Jobs, Higher studies, Entrepreneurship

MOOCs and Hackathons : Introduction to MOOCs and Hackathons, Types of MOOCs, Various MOOCs Platforms, Benefits of MOOCs, Globally Recognized Hackathons and Competitions, MAANG Companies

Unit V

Computer Network and Communication : Network types (wired and wireless), Network topologies, Network communication devices (Routers, Switches, Modems, Hubs, access point), Setting IP addresses, sharing files and folders, Remote Login, SSH, Wireless Security (http vs https), Client Server model, Types of Servers (Proxy servers, Application server, Web server, File server, Database server, Synchronization server, Log server).

Unit V

Security Essentials : Basic security threats (malwares, Phishing, Social engineering, Password cracking), Password management (Password complexity, Change default passwords), Open WiFi vs. secure WiFi, Multi Factor authentication, Admin vs. user vs. guest Account.

Unit VI

Version Control : Overview of Git and GitHub, Install git and create a GitHub account, Create a local git repository, Add a new file to the repository, Creating a commit, Creation of a new Branch

Profile Creation : Figma, GitHub, Stack overflow, HackerRank, HackerEarth, GeeksforGeeks.

References:

1. OPERATING SYSTEM CONCEPTS by ABRAHAM SILBERSCHATZ, PETER B. GALVIN, GERG GAGNE, WILEY

2. RED HAT RHSCA/RHCE 7 by SANDER VAN VUGT, PEARSON